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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/078,373	02/21/2002	Frank Menzel	219209US0X	4933
22850	7590	10/04/2004		
OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314				
			EXAMINER VIJAYAKUMAR, KALLAMBELLA M	
			ART UNIT 1751	PAPER NUMBER

DATE MAILED: 10/04/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/078,373

Applicant(s)

MENZEL ET AL.

Examiner

Kallambella Vijayakumar

Art Unit

1751

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 21 February 2002.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-21 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 02/21/02.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

*Detailed Action*

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- Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.
- The listing of references in the specification is not a proper information disclosure statement. 37 CFR 1.98(b) requires a list of all patents, publications, or other information submitted for consideration by the Office, and MPEP § 609 A (1) states, "the list may not be incorporated into the specification but must be submitted in a separate paper." Therefore, unless the examiner on form PTO-892 has cited the references, they have not been considered.

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*Claim Rejections - 35 USC § 102*

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The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

1. Claims 1-6, 8-11 and 16-19 are rejected under 35 U.S.C. 102(b) as being anticipated by Fukugaku et al (JP 2000-265161).

Fukugaku et al disclose a CMP slurry comprising polishing particles comprising mixed crystal particles composed of (A) silica and (B) alumina, wherein the mixed crystal ratio of the component B to the component A is preferably 1 to 9 <Instant Claims: 1, 3, 5-6>, and this slurry is preferably at pH 4 to 9 <Instant Claim: 9>. Further, it is desirable that ammonium peroxodisulfate or hydrogen peroxide is used in this slurry as an oxidizing agent because there is no need of changing the pH of the slurry within the range from 4 to 9 <Instant Claim:10>. This slurry, as necessary, may include an oxidation retarder <Instant Claim:12>, polishing particles, dispersant <instant Claim:13>, an organic acid or the like <Instant Claim: 11> aiming at improvement of holding the particles on a polishing pad. Claims-2 and 4 are rejected because, when the reference teaches a product that appears to be the same as, or an obvious variant of, the product set forth in a product-by-process claim although produced by a different process, the claim is not patentable. See *In re Marosi*, 710 F.2d 799, 218 USPQ 289 (Fed. Cir. 1983) And *In re Thorpe*, 777 F.2d 695, 227 USPQ 964 (Fed. Cir. 1985). See also MPEP §2113. Fukugaku et al further disclose a method for CMP of surfaces including surfaces of metals such as Al and Ti, nitride and oxide films that would meet the limitation of instant claims 16-19. A 3- wt% solid content of the slurry would meet the limitation of instant claim-8 {*Abstract, Claims 1-8, Sections: 0011-0014, 0022-0023, 0033, 0041-0042, 0048-0053*}. The surface coating of the alumina or silica crystals by silica and alumina respectively would be inherent in the silica-alumina-mixed oxide crystal powder per the limitation of instant claim-5. The most stable forms of crystalline alumina would be the alpha and delta forms and the limitation of instant claim-6

would be inherent. Mixing the particles at a shear rate per the limitation of instant claim-14 would be anticipated. All the limitations of the instant claims are met.

The reference is anticipatory.

2. Claims 1-2, 4-5, 8-9 and 14-15 are rejected under 35 U.S.C. 102(e/a) as being anticipated by Pryor (US 67,294,106).

Pryor disclose composition and making of abrasive slurries comprising of silica-based particles including  $\text{SiO}_2\cdot\text{Al}_2\text{O}_3$  and  $\text{MgO}\cdot\text{SiO}_2\cdot\text{Al}_2\text{O}_3$ . Pryor further discloses that these mixed oxides could be prepared by either conventional blending or co-gelling procedures. The particles were treated an autoclave to control the particle size and surface area in or4der to control the polishing characteristics, in the process of making the slurries, and this would meet the limitations of the dispersing, particles, followed by pressurizing and releasing the pressure in instant claims 14-15. The surface area of the typical abrasive was less than  $60 \text{ m}^2/\text{g}$ . The abrasive slurry contained 1-30% by wt. of solids that would meet the limitation of instant claim-8, and the pH was in the range of 4-6 that would meet the limitation of instant claim-9. The surface coating of the particles of silica and alumina per the limitation of the instant claim-5 would be inherent by virtue of the method of making the particles. Pryor teaches the use of fumed abrasive materials that would meet the limitation of instant claims 2 and 4, and these product-by-process claims are not patentable. All the limitations of the instant claims are met.

The reference is anticipatory.

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*Claim Rejections - 35 USC § 103*

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The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
  2. Ascertaining the differences between the prior art and the claims at issue.
  3. Resolving the level of ordinary skill in the pertinent art.
  4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
1. Claims 12-15 and 20-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fukugaku et al (JP 2000-265161) as applied to claim 1 above, and further in view of Itakura et al (JP 2000-133621) or Naoyuki et al (JP 2000-109810) or Lee et al (WO 00/17282).

The disclosure by Fukugaku et al on the composition, methods and applications of CMP in Rejection-1 Under 35 USC 102(b).

Fukugaku et al teach the use of oxidation retarders in the composition, but do not disclose the use of specific retarders/inhibitors or the use of amphoteric surfactants in the composition or the use of pressure mixing in making the slurry.

In the analogous art Naoyuki et al teach the use of amphoteric biodegradable polymers having free COOM groups and/or SO<sub>3</sub>M groups and NH<sub>2</sub> groups, where M is H, NH<sub>4</sub>, Na or K,

in making of oxide based CMP slurries, that would read on the limitation of surface-active agent in instant claim-13 (Abstract).

In the analogous art, Itakura et al teach the composition of oxide based CMP slurries to include grains of abrasives such as aluminum oxide, oxidizing agent such as peroxides, corrosion inhibitors such as benzotriazoles and an amino acid that would meet the limitation of surface-active agents, and their benefits (Abstract).

In the analogous art Lee et al disclose the mixing of the components of the oxide based CMP slurry in a tank, and further dispersing the mixture in a dispersion chamber using the counter collision of the particles under pressure to aid the dispersion so as to benefit from minimized scratching of particles and having a narrow distribution of 30-500 nm particles (Abstract).

It would have been obvious to one with ordinary skill in the art to make obvious modifications to the CMP slurry composition of Fukugaku et al by optionally adding an oxidation retarder/stabilizer/inhibitor such as triazole to benefit from improved stability of the etched surface from oxidation/corrosion per the teachings of Itakura et al, and/or add amphoteric biodegradable polymers to benefit from improved polishing performance and minimize redeposition of the etched particles per the teachings of Naoyuki et al, because Fukugaku et al teach the addition of various additives and suggestive of using inhibitors and dispersants, and all the teachings are in the analogous art; and/or further make the slurry optionally using pressure mixing per the teachings of Lee et al to benefit from narrow distribution of abrasive particles without the deformation of particles thus improving the quality of the slurry and polishing, because both the teachings are in the analogous art, and with the expectation of reasonable success in obviously arriving at the limitations of the instant claims. Surface coating of the CMP

slurry and the etching surfaces per the limitations of instant claims 20-21 would have been obvious material use of the slurry, and obvious procedural steps and process step modification to the CMP-Method of Fukugaku et al, to a person of ordinary skill in the art at the time of the disclosure of the invention by the applicants, as it was customary to vary steps based on the needs of the application.

2. Claims 6-7, 10-13, 16-21 rejected under 35 U.S.C. 103(a) as being unpatentable over Pryor (US 67,294,106) as applied to claim 1 above, and further in view of either Sakatani et al (US 5,804,513) or Kaufmann et al (US 5,783,489) or Cote et al (US 6,375,693).

The disclosure by Pryor on the composition and methods using CMP solutions in Rejection-2 Under 35 USC 102(e/a).

Pryor does not disclose crystallinity of alumina in the mixed oxide, the addition of various additives such as oxidizers, dispersants and inhibitors in the CMP slurries and their applications to various surfaces, although incorporation of such additives was customary in the art.

In the analogous art Sakatani et al disclose the predominance of alpha and gamma forms alumina in the CMP slurries (Col-2, Lines: 23-38; Col-5, Lines: 45-51), anchoring of one oxide over the other oxide (Col-3, Lines: 54-65; Col-4, Lines: 38-54), use of oxidizing agents (Col-4, Lines: 3-11), pH of the slurry to be about 7 or less (Col-3, Lines: 61-65) and polishing of metal and oxide layers (Col-9, Lines: 26-31).

In the analogous art, Kaufmann et al teach the composition of CMP slurries to include grains of abrasive oxides such as fumed aluminum oxide and silica with a surface area of 30-170 m<sup>2</sup>/g in the amounts of 1-9% by wt (Col-4, Lines: 47-65; Col-5, Lines: 21-28) and additives such as



organic acids and amphoteric stabilizers, and keeping the pH in the range of 2-8, and addition of oxidizing agents and polishing of metals and oxides (Col-5, Line-55 to Col-7, Line-64; Col-9, Examl-2, Table-1).

In the analogous art Cote et al teach the addition of corrosion inhibitors such as BTA and its benefits in the formulation of oxide based CMP slurry and its applications (Abstract, Col-5, Lines: 4-35).

The crystallinity of the alumina in the mixed oxide per the limitation of instant claim 6 and the surface area of the mixed oxide that has a wide range for the material per the limitation of the instant claim-7 would have been obvious over Sakatani et al. Further, coating and polishing of a metal/alloy/oxide surface using the CMP slurry of Pryor would have been obvious to a person of ordinary skill in the art in view of either Sakatani et al or Kaufmann et al or Cole et al.

It would have been obvious to one with ordinary skill in the art to make obvious modifications to the CMP slurry composition of Pryor et al by optionally adding an oxidizing agent per the teachings of either Sakatani et al or Kaufmann et al to benefit from improved functionality; and/or optionally include carboxylic acid, amphoteric surfactants and corrosion inhibitors to benefit from improved stability and enhanced polishing performance; and/or optionally include BTA as the specific corrosion inhibitor to benefit from enhanced retardation of oxidation and corrosion per the teachings of Cole et al, because all the teachings are in the analogous art and with the expectation of reasonable success in obviously arriving at the limitations of the instant claims.

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*Double Patenting*

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The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

1. Claims 1-2, 4-6, 8 and 16 provisionally rejected under the judicially created doctrine of double patenting over claims 1-2, 5, and 11 of copending Application No. 10/199504. This is a provisional double patenting rejection since the conflicting claims have not yet been patented.

The subject matter claimed in the instant application is fully disclosed in the referenced copending application and would be covered by any patent granted on that copending application since the referenced copending application and the instant application are claiming common subject matter, as follows: because, both the listed claims in the instant application and the on copending application are drawn to same materials and their aqueous dispersions, and they are not patentably distinct.

Furthermore, there is no apparent reason why applicant would be prevented from presenting claims corresponding to those of the instant application in the other copending application. See *In re Schneller*, 397 F.2d 350, 158 USPQ 210 (CCPA 1968). See also MPEP § 804.

2. Claims 1-7, 14, 16, 20-21 are rejected under the judicially created doctrine of double patenting over claim 1-7 of U. S. Patent No. 6,455,455 since the claims, if allowed, would improperly extend the "right to exclude" already granted in the patent.

The subject matter claimed in the instant application is fully disclosed in the patent and is covered by the patent since the patent and the application are claiming common subject matter, as follows: because, both the listed claims in the instant application and the patent are drawn to same materials and their aqueous dispersions and applications, that are not patentably distinct.

Furthermore, there is no apparent reason why applicant was prevented from presenting claims corresponding to those of the instant application during prosecution of the application which matured into a patent. See *In re Schneller*, 397 F.2d 350, 158 USPQ 210 (CCPA 1968). See also MPEP § 804.

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### *Conclusion*

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- The prior art made of record and not relied upon is considered pertinent to applicant's disclosure: Inoue et al (US 6,620,508).
- Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kallambella Vijayakumar whose telephone number is 571-272-1324. The examiner can normally be reached on M-Th, 07.00 - 16.30 hrs, Alt. Fri: 07.00-15.30 hrs.
- If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dr. Yogendra Gupta can be reached on 571-272-1316. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

- Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

KMV  
09/30/2004

  
**Mark Kopet**  
**Primary Examiner**